

CLAIMS

1. An IC card configured to be communicable with a card reader by receiving a high-frequency signal transmitted from the card reader through an antenna unit provided on an IC card body, rectifying the high-frequency signal to generate an operating voltage, and demodulating a modulating signal superimposed on the high-frequency signal, wherein

the antenna unit is composed of paired electrostatic coupling antennas spaced from each other;

the paired electrostatic coupling antennas comprise first and second metallic thin films arranged on a front surface of or in the vicinity of the front surface of the IC card body separately from each other; and third and fourth metallic thin films arranged on a back surface of or in the vicinity of the back surface of the IC card body separately from each other; and

the first and third metallic thin films are opposed to each other and connected to each other to form one of the paired electrostatic coupling antennas; and the second and fourth metallic thin films are opposed to each other and connected to each other to form the other of the paired electrostatic coupling antennas.

2. The IC card according to claim 1, wherein each of the paired electrostatic coupling antennas is formed to have long sides in a longitudinal direction of the IC card body, and the paired electrostatic coupling antennas are arranged side by side in a width direction of the IC card.

3. The IC card according to claim 1, further comprising a modulating circuit which amplitude-modulates the high-frequency signal, by varying load impedance between the paired electrostatic coupling antennas.

4. The IC card according to claim 2, further comprising a modulating circuit which amplitude-modulates the high-frequency signal, by varying load impedance between the paired electrostatic coupling antennas.

5. The IC card according to claim 3, further comprising a rectifying circuit which rectifies the high-frequency signal to generate the operating voltage, wherein the modulating circuit is configured to vary the load impedance between the paired electrostatic coupling antennas, by varying load impedance at an output port of the rectifying circuit in synchronization with answer back data to the card reader.

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6. The IC card according to claim 4, further comprising a rectifying circuit which rectifies the high-frequency signal to generate the operating voltage, wherein the modulating circuit is configured to vary the load impedance between the paired electrostatic coupling antennas, by varying load impedance at an output port of the rectifying circuit in synchronization with answer back data to the card reader.

7. The IC card according to claim 1, wherein the paired electrostatic coupling antennas are formed on the front and back surfaces of the IC card body, and rust preventive coatings are provided on the front and back surfaces of the IC card body.

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8. A card reader configured to be communicable with the IC card according to any one of claims 1 to 7, comprising:

paired reader-side electrostatic coupling antennas arranged to be opposed to any one of the front and back surfaces of the IC card inserted into an IC card insertion slot, and arranged to be able to be opposed to each of the paired electrostatic coupling antennas provided on any of the front and back surfaces or in the vicinity of any of the front and back surfaces, and wherein

15 the card reader is configured to transmit the high-frequency signal to the IC card through the paired reader-side electrostatic coupling antennas and the paired electrostatic coupling antennas on the IC card.

20 9. A card reader configured to be communicable with the IC card according to any one of claims 1 to 7, comprising:

one of reader-side electrostatic coupling antennas arranged to sandwich the first and third metallic thin films of the IC card inserted into an IC card insertion slot; and
25 the other of the reader-side electrostatic coupling antennas arranged to sandwich the second and fourth metallic thin films of the IC card, and wherein

the card reader is configured to transmit the high-frequency signal to the IC card through the paired

reader-side electrostatic coupling antennas and the paired electrostatic coupling antennas on the IC card.